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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Hidenori YATO

Group Art Unit: 2811

Application No.: 10/775,126

Examiner: H. VU

Filed: February 11, 2004

Docket No.: 118425

For: SOLID-STATE IMAGING DEVICE

REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the April 5, 2005 Office Action, reconsideration is respectfully requested in light of the following remarks.

Claims 1-5 are pending.

The Office Action rejects claims 1-5 under 35 U.S.C. §102(b) over Miida (U.S. Patent No. 6,504,194). The rejection is respectfully traversed.

Prior to commenting on the patentability of the claims, the following remarks are made to aid in understanding the claimed invention.

For example, a problem associated with a solid-state imaging device is that residual holes are picked up in a next cycle as a residual image. Referring now to Fig. 10, when photoholes accumulated in a carrier pocket 131 (see Fig. 8) are reset by discharging photoholes from the carrier pocket 131, it may be difficult to make the number of residual holes to be 0.

That is, the number of accumulated holes in the carrier pocket 131 changes depending on the amount of light entering the photo diode 111. The amount of accumulated holes is large when the amount of entering light is large, and is small when it is small. Thus, depending on the number of accumulated holes, namely the amount of entering light, the number of residual holes that are not discharged from the carrier pocket 131 during a reset period also changes. If the number of residual holes is constant, an affect due to the number of residual holes can be canceled as noise data. However, if the number of residual holes changes depending on the number of accumulated holes, an effect due to the number of residual holes depending on the change of amount of entering light cannot be canceled such that an image that was picked up in the previous cycle remains in an image that is picked up in the next cycle as a residual image. See, for example, paragraphs [0056] and [0057] of the application.

To solve the problem, a pre-charge period is performed prior to a reset period as shown in Fig. 11. Accordingly, claim 1 recites that the control circuit forward biases a junction region between a semiconductor substrate and a semiconductor layer so as to accumulate a predetermined amount of charges of a given conductivity type in an accumulation region.

Nowhere does Miida disclose or suggest this feature. Miida instead discloses, in Fig. 9 and at col. 11, lines 7-25, an initializing operation that sweeps out carriers remaining in a carrier pocket. According to Miida, an abrupt change of a potential is caused in a second well region 15B (see Fig. 4), and thus a strong electric field for sweeping out the holes to a substrate 11 side is applied mainly to the second well region 15B. Thus, the carriers can be swept out by a low reset voltage without fail. Miida, however, does not disclose or suggest accumulating a predetermined amount of the charges of the given conductivity type in the accumulation region.

Therefore, independent claim 1 defines patentable subject matter. Claims 2-5 depend on independent claim 1, and, therefore, also define patentable subject matter as well as for the other features they recite. Accordingly, withdrawal of the rejection under 35 U.S.C. §102(b) is respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-5 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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Date: June 6, 2005

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